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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,702	03/19/2004	Irene Chen	UTEP0014USA	2701
27765 7590 12/29/2006 NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			EXAMINER SULLIVAN, CALEEN O	
			ART UNIT	PAPER NUMBER
			1756	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/29/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/708,702	CHEN ET AL.	
	Examiner	Art Unit	
	Caleen O. Sullivan	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It was not executed in accordance with either 37 CFR 1.66 or 1.68. The signatures of the applicants are not dated.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification. Claim 5 recites the term “neutral light” as one of the irradiation sources; however, applicant has failed to describe in the specification what a “neutral light” is.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 2, 4-5, 9 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 9 include the phrase “... photoresist layer is selected from a group consisting of ...” which Examiner considers to be claims that include a Markush group written in improper format. Claims 5 and 14 include the phrase “...uses a light source selected from a group consisting

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of...” which Examiner also considers to be claims that include a Markush group written in improper format. “Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being “selected from the group consisting of A, B and C.” See *Ex parte Markush*, 1925 C.D. 126 (Comm’r Pat. 1925). These claims should be amended to recite proper Markush Language.

Claims 2 and 9 are of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The recitation in claims 2 and 9 delineates all the types of photoresist there are; therefore, it is not further limiting of the claims from which they depend.

The term “LIGA” in claim 4 is used by the claim to mean “electroforming or electroless plating”, while the accepted meaning is “a process that consists of lithography followed by electroplating followed by molding.” (<http://www.ca.sandia.gov/liga/tech.html>). Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999).

Claim 5 includes the term “neutral light” when listing the sources of irradiation for patterning the photoresist layer; however, it is unclear what a neutral light is.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-14 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Brain ('445).

Brain ('445) discloses a method of forming a metal line. In this method an electrically insulative layer in the form of a photoresist is deposited on a substrate over which an intermediate metal layer has been formed. (See, col.4, 24-28). The photoresist is then patterned using well-known techniques in the art, such as exposing the photoresist to light, which is transmitted through a mask. (See, col.4, 29-39). After the exposure a selective etch is carried out which removes either exposed or unexposed areas in the photoresist layer. (See, col.4, 29-39). This disclosure in Brain ('445) teaches the limitations of claim 1 and 8, where a photoresist layer is disposed over a substrate upon which an exposure and developing process is performed using a mask for patterning the photoresist layer as well as the limitation of claim 17 where the mask is a film.

Brain ('445) goes on to disclose the next step in the method after forming the pattern in the photoresist layer, which is a step of forming a metal seed layer on the photoresist layer that is deposited by a directional depositing technique. (See, col.4, 45-56). Brain ('445) gives examples of directional depositing techniques that are known in the art, which includes collimated sputtering and chemical vapor deposition. (See, col. 4, 45-56). This disclosure teaches the limitation of claim 1 where a seed layer is formed on the substrate and photoresist pattern, and the limitation of claim 12 where before the metal layer is formed a seed layer that overlies the substrate and photoresist

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pattern is formed. Moreover, this disclosure teaches the limitation of claims 3 and 13 wherein the seed layer is formed by evaporating, sputtering or electroless plating.

Brain ('445) then discloses that after the seed layer is formed on the substrate and photoresist layer a metal plating is formed on the structure using an electroplating or an electroless plating technique. (See, col. 5, 29-35). This disclosure teaches the limitation of claim 1 where a metal layer is formed on the seed layer by a LIGA process for implementing the metallic structure, and the limitation of claim 4 where the LIGA process comprises electroforming or electroless plating. This disclosure also meets the limitation of claim 8, where a thin film is formed on the substrate and the photoresist pattern by a thin film process and the limitation of claim 11 where the thin film is a metal layer. Moreover, this disclosure teaches the limitation of claim 10 where the thin film process comprises physical vapor deposition, chemical vapor deposition, electroforming or electroless plating.

Although Brain ('445) does not specify the irradiation sources, such as those recited in claims 5 and 14, used during the exposure step disclosed, one of ordinary skill in the art would be able to choose the appropriate source of light depending upon the type of photoresist material used during the process. Moreover, Brain ('445) does not specify whether the photoresist is one of the types listed claims 2 and 9; however, the recitation in claims 2 and 9 delineates all the types of photoresist making it inherent that Brain ('445) teaches the types of photoresist recited in claims 2 and 9.

Brain ('445) teaches all the limitations of claims 1-5, 8-14 and 17.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the

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subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 6-7 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brain ('445) in view of Fein ('867). Brain ('445) is relied upon as discussed in the rejection of claims 1-5, 8-14 and 17 under 35 USC 102 (b) in paragraph 6 above.

Brain ('445) fails to disclose a step of performing a release process for releasing the metallic structure from the substrate. Brain ('445) also fails to disclose that the metallic structure that is released can be used as an insert mold in an injection-molding machine. Brain ('445) further fails to disclose performing an injection molding process with the metallic structure as the insert mold to fabricate pictures with patterns complementary to the pattern of the thin film. However, Fein ('867) does disclose a release process as well as the use of an insert mold formed in an injection molding machine and injection molding process to fabricate pictures.

Fein ('867) discloses an imaging system, methodology and other applications that can facilitate optical imaging performance. Fein ('867) discloses this system can be used to monitor process steps such as when metal impressions such as sons or stampers are made and used as molds for injection molding. Fein ('867) discloses that the process of forming the inserts or masters includes first coating a plate with photoresist, where a laser is used to write a pattern into the

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photoresist layer, which is then developed. (See, para. 0220). Then a layer of metal is evaporated over the photoresist, which is followed by an electroforming process whereby additional metal is deposited. (See, para. 0220). When the metal is deposited to a desired thickness, the metal layer is separated from the glass master. (See, para. 0220). This disclosure in Fein ('867) meets the limitations of claims 6 and 15, where a releasing process is performed to release the metallic structure from the substrate.

Fein ('867) goes on to disclose the released metallic structure is used as a father or negative metal impression of the substrate, on which the electroplating process is repeated to generate positive impressions, called mothers. (See, para. 0220). The mothers are electroplated to form negative metal impressions, which are called sons or stampers and are suitable for use as molds in injection molding. (See, para. 0220). This disclosure teaches the limitations of claims 7 and 16 where the metallic structure released from the substrate is used as an insert mold in an injection-molding machine in a process from which many pictures with patterns complementary to the pattern of the metal layer are formed.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the teachings of Brain ('445) with the teachings of Fein ('867), because Fein ('867) teaches one can separate a metallic layer, formed by a process such as the one taught in Brain, from the substrate so it can function as an insert mold for processes using an injection molding machine to create multiple pictures of the metallic structure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caleen O. Sullivan whose telephone number is 571-272-6569. The examiner can normally be reached Monday-Friday, 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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